

BOARD OF EDUCATION.

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England: Board of Education

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BUILDING REGULATIONS

SECONDARY SCHOOLS

BEING

PRINCIPLES TO BE OBSERVED IN

PLANNING AND FITTING UP NEW BUILDINGS IN ENGLAND.

Presented to both Houses of Parliament by Command of His Majesty.



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25. 1. 1915

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PREFATORY NOTE.

Character of the Regulations.

(i) The Board's Building Regulations are partly a statement of principles of school planning upon which the Board proceed in criticising the plans submitted to them, and partly a statement of what the Board believe to be the best current practice in the application of those principles. Taken as a whole, the regulations are not a code of precise and definite rules with which compliance is required. A great part of the regulations does not admit of expression in the form of requirements, and their main object is to facilitate co-operation between the Board of Education and the Local Government Board on the one hand, and Local Education Authorities and school architects on the other, in securing the greatest amount of comfort, convenience and suitability which a reasonable expenditure can be made to yield. The combination of efficiency and economy is the perpetual problem of the school architect. In endeavouring to raise the standard of efficiency, the Board of Education are bound to have regard to economy, because the funds available for school buildings are not unlimited, and extravagance in particular cases is bound to hamper that all-round improvement which the national interest demands. The problem for the Board of Education is in some respects even more difficult than it is for the architect or the member of the Local Education Authority who is responsible to the ratepayer. On the one hand the Board must try to secure schools which will yield the greatest possible educational advantage to the rising generation, and in considering educational advantages they do not ignore the effect of beauty of design, material or decoration on the minds of the children or of their parents whose respect for and belief in education are essential to progress. On the other hand, the Board have to take account of the present state of public opinion, whether expressed in Parliament or in the Municipal Assemblies to whom Parliament has committed responsibility for the local administration of education, and while endeavouring to influence public opinion in the direction which they believe to be beneficial to the nation they cannot ignore the risk of provoking reaction. In this, as in other departments of administration, some degree of compromise is inevitable.

(ii) The present regulations are the outcome of discussions which have taken place during the last six years in numerous particular cases between the Board's Officers and the Officers and Architects of Local Education Authorities and Governing Bodies; they have also been submitted in draft to certain bodies and individuals whose experience specially qualified them to advise the Board in the matter. The Board gratefully acknowledge the assistance they have received; and while they take entire responsibility for the present form of the regulations, they hope that they represent a very general consensus of opinion both of professional architects and of other persons engaged in educational administration.

Need for New Regulations.

(iii) The last issue of the Regulations was made in 1907, and experience has shown (as indeed was to be expected in a matter in which progress has been so rapid and development is so continuous) that a fresh statement of principles and of their applications is required, involving some not unimportant modifications of Regulations issued seven years ago. In school-planning certain principles are tolerably well settled; but the modes in which even the most firmly established may be applied, and the standards by which they are tested in concrete cases, are subject to change. Theory and practice alike are constantly developing, with a tendency, it may be, towards restriction and uniformity in some directions, towards relaxation and variety in others. The principal modifications in the present issue relate to the position of the Assembly Hall in relation to the class-rooms, the need of making provision for Physical training in every new school, the arrangement of cloak-rooms, and certain details in connection with Art and Science rooms, Housecraft rooms and staircases.

Arrangement of the Regulations.

(iv) In this new edition the arrangement of the Regulations has been revised. The division into two parts, one dealing with principles and one with hygienic and sanitary requirements, has proved to be inconvenient. All the regulations that refer to one subject are now grouped under the same heading, though it has not been found possible to make the several sections mutually exclusive and some repetition has been found inevitable. In the order adopted sites and general considerations are first dealt with; next a list is given of all the rooms which may be found in a Secondary School; then detailed provisions are set out with regard to each of these rooms. The following chapters deal with the Boarding Houses, ventilation and heating, construction and materials, and water supply. At the end the procedure for obtaining approval of plans is set out. A note on the requirements of the Local Government Board relating to Loans in respect of Schools other than Public Elementary Schools is printed as an Appendix.

Discussion of Plans.

(v) The Board will at all times be glad to place their experience at the disposal of the promoters of a new school, or to discuss a building scheme either before the preparation of plans, or while the drawings are in a preliminary stage. They will be ready to give careful and, so far as possible, favourable consideration to individual designs or experimental modes of treatment which promoters of schools and their architects may propose to adopt to meet the special exigencies of particular cases.

A preliminary discussion is especially desirable in any case where it is contemplated that the premises shall also be used for instruction under the Regulations for Technical Schools, Schools of Art, &c. Such a discussion should, if possible, be held before a site is determined upon.

Existing Buildings.

(vi) These Regulations do not constitute a standard by which the recognition of existing premises can be determined; and they are plainly unsuitable for any rigid application to proposals for alterations of existing buildings. Such cases must be dealt with individually as they arise, with reasonable regard to the principles set forth in the Regulations.

L. A. Selby-Bigge

22nd July, 1914.

REGULATIONS.

CHAPTER I.—SITES, PLAYGROUNDS, AND PLAYING-FIELDS.

Choice and General Treatment of Site.

1. The site for a new School should be carefully chosen. If possible, it should be in an open situation and have no undesirable surroundings. It should not be exposed to noise or dust from roads, streets, tram-lines, railways or works. It should be such that the building can either be set well back or have its class-rooms on a side away from the street or road, so that there may be no difficulty in keeping their windows open, and it should allow of classes being taken in the playground.

2. There should be convenient access to the site.

3. The site should be open to the sun, both for the sake of the general health of the pupils and staff, and because the ventilation of the building is then easier.

The site should secure the best aspect possible for the class-rooms, which is South-East. In the warmer parts of England, East may be a better aspect than South. Rooms which face South-West get little sun in the early part of the day, while subsequently they are apt to get too much. Windows which look to quarters other than these should, so far as possible, be those of corridors, staircases, cloak-rooms, assembly halls, cookery rooms, Art rooms, and the like.

4. In selecting a site regard should be had to the configuration and nature of the ground in order to avoid unnecessary expense in building.

5. The most should be made of any natural advantages which the site may possess. Pleasant views should be left open instead of being shut off by high boundary walls. Provided that the playground proper is not interfered with, dull walls may be covered with creepers and bordered with flower beds. If it is consistent with the proper lighting of the School, trees should be preserved or planted to give shade in summer to open-air classes.

6. When the extent of the site is being considered, the provision of suitable plots for Botany, gardening and other natural history work should be borne in mind.

Area of Playground.

7. In every school there must be a playground suitable to the size of the school, which should provide a clear space of 50 square feet per head, but in no case must the playground contain less than 750 square yards. Special consideration will be given to the case of schools in large towns.

Arrangement of Playground.

8. In schools for Boys and Girls there should be separate playgrounds for the two sexes.

9. (a) The playground should be given a warm, sunny aspect, and provided with seats. (b) The buildings should be so planned that the effective playground space will not be unduly diminished by projecting wings or buttresses.

10. (a) The playgrounds should be properly levelled, drained, and provided with a suitable surface. Cinders, large stones, grass, and loose gravel are to be avoided. (b) The drainage should be so arranged that man-holes, gulleys, &c., are not placed in the central parts of the playground. (c) Some portion at least of the surface should be so paved as to provide sufficient space for exercise in wet weather. (d) The playground must be effectively enclosed.

11. Bicycle sheds should be provided.

Playing-Fields.

12. Playing-fields must in all cases be provided. Wherever possible, the playing-fields should be adjacent to the School, and every effort should be made to secure a site which will admit of this arrangement. If this cannot be obtained, the proximity of, and ease of access to, playing-fields should be taken into consideration in the choice of a site for the School.

13. The minimum effective area for a playing-field may be taken as two acres. This will usually suffice for a School of 100 pupils, but the area will require to be increased in proportion to the number of pupils and the extent to which games enter into the organisation of the School. Boys, as a rule, require more playing space than girls.

CHAPTER II.—GENERAL ARRANGEMENT OF THE BUILDING.

Organisation of the School.

14. Before any instructions are given to an Architect to prepare plans for a new building, careful consideration should be given to the proposed organisation of the school; the number of Masters or Mistresses to be employed; the probable size of the classes in the different parts of the school; the relative importance of the teaching of Science, Art, and Manual Work; the convenient grouping of the rooms; and the possible use of the buildings, or any part of them, for Evening Classes or for Day Instruction in Technical or Domestic Subjects, so that the plan of the building may be fully adapted to the work to be done in the school.

15. A margin of accommodation should be provided, sufficient to secure the necessary elasticity of organisation. The practice of dividing up classes for different subjects makes the provision of some small class-rooms desirable.

General Arrangements.

[See also Section 4.]

16. The general arrangement of the building should be governed by the endeavour to secure a suitable aspect, effective ventilation for the class-rooms, convenience of organisation, and economy in maintenance. (a) The need for really effective ventilation and the importance of securing abundant sunlight are now generally recognised. The older type of building, compactly planned with several storeys, with a central hall off which the class-rooms open directly, is giving place to single-storeyed groups of rooms, arranged to let the sun and air into every corner. (b) Windows of the ordinary type on one side of the room only, with some form of extract in the chimney or ceiling, and inlet tubes in the walls, can no longer be considered as providing the best form of ventilation for a class-room. Far more satisfactory results can be obtained by placing windows on opposite sides of the rooms, and so ensuring a fresh current of air. Experience has shown that if these windows are so arranged as to introduce the incoming air on a low level and to direct it upwards, and if a really adequate amount of heating is provided, an abundant supply of fresh air can be admitted all the year round. The heating surface will have to be increased above that required in the older type of rooms.

17. The general plan of the building will be largely determined by the position of the Assembly Hall and its relation to the class-rooms; it is important, therefore, that this should be carefully considered. Although it is possible in the case of Girls' Schools to make a suitably placed and properly fitted room serve the double purpose of a Gymnasium and Assembly Hall, it is very desirable to have a special room for the former purpose alone; in the case of Boys' Schools the provision of a Gymnasium is of even greater importance, as their ordinary boots both spoil the floor and introduce too much dust for the combined arrangement to be satisfactory.

Economy.

18. In the style and general treatment of the building, every care should be taken to secure economy. The Board regard this as a matter of great importance. All proposals for new Schools will be carefully examined and the Board will ask for the omission of any features that appear extravagant, and may require a modification of the whole scheme should the proposed expenditure appear unreasonably high.

The possibility that the school may require enlargement in the future should be borne in mind, and in cases where an early extension is likely to be required the future additions should form part of the original scheme and be included in the plans submitted to the Board.

CHAPTER III.—ACCOMMODATION (WITH SCHEDULE).

19. The accommodation of the School is reckoned upon the number of places provided in the class-rooms. A lecture room may be reckoned in assessing the number for which the School will be recognised.

20. The number for which any room will be counted depends not merely upon the area, but also on the lighting, the position of the doors and windows, and the general shape of the room.

21. The details of the accommodation ordinarily required in a Secondary School are dealt with under the following headings :—

- (i) Entrances (§ 22).
- (ii) Staircases (§§ 23-25).
- (iii) Corridors (§ 26).
- (iv) Assembly Halls (§§ 27-29).
- (v) Class-rooms (§§ 30-48).
- (vi) Science rooms (§§ 49-67).
- (vii) Lecture rooms (§§ 68-71).
- (viii) Art rooms (§§ 72-75).
- (ix) Housecraft rooms (§§ 76-85).
- (x) Handicraft rooms (§§ 86-89).
- (xi) Preparatory Classes and Departments (§§ 90-93).
- (xii) Staff rooms (§§ 94-96).
- (xiii) Store rooms (§ 97).
- (xiv) Dining Halls (§§ 98-100).
- (xv) Library (§ 101).
- (xvi) Music rooms (§ 102).
- (xvii) Gymnasium (§§ 103-108).
- (xviii) Cloak-rooms (§§ 109-115).
- (xix) Lavatories (§§ 116-117).
- (xx) Closets (§§ 118-124).

CHAPTER IV.—DETAILS OF VARIOUS PARTS OF THE BUILDING.

(i) ENTRANCES.

22. (a) Entrances must not lead directly from the outside into an Assembly Hall or other room, and must not be used as cloak-rooms. (b) An external door, having outside steps, requires a landing between the door and the top step. (c) Entrance doors should open outwards. (d) In schools of more than 150 scholars there should be more than one exit. (e) In schools for both boys and girls there must be a separate entrance for each sex.

(ii) STAIRCASES.

23. (a) In schools with more than 150 pupils, if the buildings are on more than one floor, at least two staircases must be provided. (b) Separate staircases must be provided for boys and girls.

24. (a) Every staircase must have at least one external wall, must be of fire-resisting materials, and must be well lighted in every part. (b) Staircases must be not less than 4 feet wide, and must not have more than 14 steps to a flight. The landings must be unbroken by steps. (c) Treads must be from 11 inches to 13 inches wide, and risers not more than 5½ inches to 6 inches high. Winders must not be used.

In settling the position of the staircase the need for easy access from the Hall to the class-rooms should be borne in mind.

25. Staircases should be so planned that an easy view can be obtained right up or down.

(iii) CORRIDORS.

26. Corridors, which should be for access only, should be from 6 feet to 8 feet wide according to the size of the School and well lighted.

(iv) ASSEMBLY HALLS.

27. The Assembly Hall should have a floor-space of at least 6 square feet for each pupil for whom the school is to provide accommodation, and it is preferable that, if the school be for less than 150, a floor-space of 8 square feet per pupil should be provided.

28. (a) It is desirable to place the Hall so that noise in it will not disturb the work in the class-rooms. (b) For this reason, as well as for ventilation and freedom from dust, the class-rooms should not open directly from it. (c) The Hall may therefore be altogether or partly detached from the main building (*see also* § 17). (d) It must be fully lighted, warmed, and ventilated.

29. If it is not possible to provide a room for specific use as a Gymnasium, the Hall must be made suitable for the purpose of physical training. In this case it should be completely separated from the class-rooms and be so placed that it does not serve as a passage-way from one part of the building to another: and its construction, with regard to ventilation, lighting, flooring, and wall-space, should approximate as closely as possible to that of a Gymnasium (*see Head xvii*).

If no Hall is provided, in addition to a Gymnasium, it is desirable to arrange two or three adjacent class-rooms with movable partitions, so that they can be thrown into one for purposes of assembly.

(v) CLASS-ROOMS.

30. (a) Class-rooms should be provided at the rate of at least four for every 100 pupils. (b) They should not be designed for more than 30, or less than 15, pupils. (c) It is desirable to have one or more division rooms in addition to the regular class-rooms, to take from 10 to 15 pupils each. (d) A lecture room if suitably arranged may be counted as the equivalent of one class-room.

31. (a) The class-rooms must not be passage-rooms from one room or part of the building to another, or from the playground or yard to any room used for teaching or to the Hall. (b) The rooms and passages should be so arranged that every room can be cleared easily and without disturbing any other room.

32. The class-rooms should be designed to take single desks, and should have a gangway of not less than 18 inches between the rows and between the desks and the wall on each side; a space of 1 foot between the last row of desks and the back wall, and a clear space for the teacher extending the full width of the room of not less than 7 feet 6 inches between the front row of desks and the wall. (Each desk may be reckoned as occupying a space of about 3 feet by 2 feet.)

33. It will be found that these dimensions provide a floor area of 16 to 18 square feet per head, according to the size of the class, but in no case must the floor area be less than 16 square feet per head.

34. The proportions of class-rooms should be such as to allow a good arrangement of the seats. Long narrow rooms are to be avoided.

35. If there is a fire-place, it should be placed at the teacher's end of the room in the corner away from the door.

Height of Class-rooms.

36. (a) The height should not be less than 12 feet if the room has a flat ceiling. (b) If it is ceiled at the collar beam, the height should be 10 feet to the wall plate and 13 feet to the ceiling. (c) The ceiling should extend over at least half the area of the room. (d) In no case may a class-room be left open to the ridge.

37. In class-rooms arranged with corresponding windows on opposite sides these heights may be diminished by one foot, but in such cases the Board will have to be satisfied of the adequacy of the cross ventilation.

Lighting of Class-rooms.

38. The area of window-glass should be approximately one-fifth of the area of the floor space.

39. The windows should be so distributed as to light every table or desk and the whole of the room evenly and sufficiently. The last vertical glass line of the window furthest from the teacher should be on a level with the back of the last row of desks.

40. (a) Where windows are provided in one wall only, this must be the wall on the left of the pupils as seated. (b) Any additional windows should be placed in the right hand wall, but not so as to throw a stronger light from the right of the pupils than from the left. (c) Windows facing either the pupils or the teacher are to be avoided. (d) Skylights cannot be approved, except in special circumstances in class-rooms.

41. Unless the top of the window be more than 12 feet above the floor, no desk should be more than 20 feet from a window.

42. (a) The lower glass line of the main lighting windows should not be more than 3 feet 6 inches above the floor. (b) The tops of the windows should as a rule reach nearly to the ceiling.

43. French casements may be approved for some rooms.

44. Windows should never be provided for the sake merely of external effect. Clear glass should be used in the windows, and all kinds of glazing which diminish the light and are troublesome to keep clean and in repair must be avoided.

45. The colouring of the walls and ceilings and of all fittings in the rooms should be carefully considered as affecting the light.

(For Ventilation and Heating, see Chapter VI.)

Furniture of Class-rooms.

46. It is advisable to keep the class-room floor level throughout. If a platform is provided for the teacher it should be about 6 inches high.

47. Ample "blackboard" space should be provided, also space for maps and diagrams. In Schools where special attention is given to the teaching of Geography, it is often found useful to have a room arranged expressly for this purpose.

48. In Schools where there are a considerable number of older pupils, one class-room at least should be treated as a Sixth-Form Room. Such a room may be furnished with tables suited to the work of the pupils, instead of desks, and may also be used as a Library (see Head xv).

(vi) SCIENCE ROOMS.

49. The provision of rooms for Science teaching should be carefully considered in relation to the work of the school and the number of pupils.

LABORATORIES.

50. A school of 150 pupils over 12 years of age will require at least one laboratory, but in a school of this size for boys and girls two laboratories will, as a rule, be necessary. A school of 200 pupils or more over 12 years of age will require two full-sized laboratories. In schools of 300 pupils or more three laboratories may be necessary.

51. Before the exact dimensions for a laboratory are decided on, the arrangement of benches, fittings, drainage, and flues for fume closets and combustion hoods should be determined and should be shown on the plans, but in no case should there be less than 30 square feet per pupil.

It is desirable that the laboratory should be large enough to take a full class in order to avoid the need for division.

52. The following dimensions will serve as a guide in planning a laboratory :—

Bench room.—Space for each pupil, not less than 3 feet 6 inches by 2 feet 3 inches. Where pupils work opposite each other the double bench may be 4 feet wide.

Gangways.—For pupils working back to back, 4 feet.

For pupils not working back to back, 3 feet.

Benches should be clear of shelves.

53. It is very useful to have side bench accommodation not normally used by pupils but available for special purposes. A demonstration table should be provided.

54. Gas and water should be laid on for benches and demonstration table. The pipes should be accessible. Sinks should be provided.

ADDITIONAL ROOMS.

55. Where work of an advanced character is done it will often be necessary, and generally desirable, to provide, in addition to the laboratories for elementary work, one or more smaller additional rooms simply furnished for advanced work.

56. All the science rooms should if possible be close together and conveniently accessible from one another.

57. A separate balance room for the balances ordinarily in use is not necessary. When such a room is provided there is usually a good deal of overcrowding, and

supervision, which is very necessary for beginners learning to weigh, is rendered difficult. Adequate provision can be made in the elementary laboratory, but balance cases of a simple kind will be necessary. In the few schools in which really delicate balances are required it will be found desirable to keep them in a small room apart from the rest.

58. In larger schools it is generally found advantageous to have a preparation room; in all schools it is necessary to have ample space for storage of apparatus and materials both in the laboratories themselves and in an adjacent room or rooms. This need is too often forgotten.

59. In many schools it has been found easy to provide a separate dark room. This room may conveniently be fitted for photographic purposes.

60. Even where a dark room exists it will often be desirable that arrangements should be made for partially darkening a laboratory when necessary for practical work in optics.

BOTANICAL LABORATORIES.

61. A Botanical laboratory need not differ in size from an ordinary laboratory for elementary chemical and physical work, but it should have an aspect that will secure plenty of sunlight for growing plants.

62. It will be found useful to provide a narrow bench under the windows about 2 feet wide for physiological experiments and such other work as requires a specially good light.

63. The benches may be plain tables providing 3 feet 6 inches by 2 feet or 2 feet 6 inches for each working place, fitted with gas.

64. Sinks should be provided.

65. A demonstration table fitted with water and gas should be provided.

66. Wall space should be utilised for reagents and apparatus. It may be convenient to have one bench 4 feet long with reagent shelves above it.

67. Greenhouse accommodation is desirable, and some arrangement for the germination of seeds.

(vii) LECTURE ROOMS.

68. In schools of 250 and over it is useful to provide one or more lecture rooms, or a class-room fitted with a demonstration table so that it may be used for lecture purposes.

69. In smaller schools lecture rooms may be omitted.

70. A Lecture room should ordinarily accommodate 30 pupils, the last three or four rows of desks being raised; a large demonstration table should be provided, and the room made capable of being easily darkened for lantern work. In big schools a larger room may be provided, constructed if desired on the principle of a theatre with rising seats. There must be a floor-space of not less than 14 square feet per pupil for the first 30 pupils, and 12 square feet for each pupil above that number.

71. Windows must not be placed facing either the teacher or the pupils.

(viii) ART ROOMS.

72. A room for teaching Drawing should provide not less than 30 square feet per pupil; a suitably shaped room would be 25 feet by 30 feet. In schools of over 300 it is desirable to provide a supplementary room for crafts and modelling, or separate rooms for advanced and elementary work.

73. The room should be lighted by a large window to the north, as far as possible in one length, not broken up by wide piers; the top should be carried close up to the ceiling. Any other windows should be fitted with light-excluding blinds.

74. The room should be provided with a sink and have water laid on.

75. In schools for 100 or less the Hall if suitably lighted may be used for Drawing.

(ix) HOUSECRAFT ROOMS.

76. The room provided for Housewifery, Laundry, and Cookery classes should allow 30 square feet of clear floor space for each pupil under instruction at any one time. In addition, space is required for fixed apparatus, which may be roughly reckoned at about 5 square feet per head.

77. A suitable number of pupils for a Housecraft class is 15 to 18; in no case should more than 20 be taken together.

78. A north aspect is desirable; special arrangements should be made for ventilating, and where necessary for warming the room.

79. The room should be so placed that smells from cooking will not penetrate into other parts of the school. A larder should be provided, the window of which should face north or east.

80. It is convenient to have two cooking ranges, one open and the other closed, to one of which a back boiler should be attached.

81. Where gas is available, a gas stove, provided with a flue pipe to carry off fumes from the oven, should be fixed in a convenient position accessible on at least three sides. Where a gas hot plate is provided, it may be separated from the oven, and should be set at a height of about 2 feet 6 inches from the ground. In cases where electricity can be used with economy it may be desirable to introduce an electric stove.

82. At least one sink, not less than 3 feet in length, with draining boards and hot and cold water laid on, should be placed in full view of the teacher and pupils; also a slop sink 12 inches deep.

83. Fixed furniture is undesirable; moveable tables providing 2 feet per pupil, with two additional tables, are needed. A convenient size for the tables is 6 feet by 2 feet 6 inches wide by 2 feet 6 inches high. In selecting them regard should be paid to their convenience for Needlework purposes.

84. For Laundry work a copper holding from 12 to 18 gallons is essential; there should be a supply tap above the copper, and also a tap for emptying it.

85. Storage accommodation, such as shelves, racks, and cupboards, is required. Suitable seats should be provided.

(x) HANDICRAFT ROOMS.

86. In every school there should be, and in every Boarding School with more than 20 boarders there must be, a Handicraft room, which should provide for the instruction at one time of not less than 15 nor more than 30 pupils. The latter number will require about 900 square feet of floor area. There should be a space of at least 4 feet in width between benches, and a clear space round every bench for wood-working. A rack for tools should be provided for every bench.

87. In its plan, arrangements, lighting and ventilation a room for teaching Handicraft should be modelled on a workshop rather than on a school. Where it does not form part of the main building of the School its construction may be very simple. The roof may be either of lean-to or other ordinary form according to circumstances. Its height at the windows in front of the benches need not be more than 9 feet. A flat ceiling is not, as a rule, necessary.

88. (a) The lighting and ventilation must be ample. (b) The room must be warmed, but need not be so warm as an ordinary class-room.

89. (a) The floor should be of wood blocks or some other material that will not damage tools dropped upon it. (b) Provision for blackboard teaching should be made.

(xi) PREPARATORY CLASSES AND DEPARTMENTS.

90. If a Kindergarten or Preparatory Class is attached to a School, it should be taught in a light, airy room or rooms, facing south or south-east, and so arranged as to provide an easy way into the open air. The room should have a fire-place.

91. Wall blackboards for the use of the children and ample cupboard accommodation should be provided.

92. The class should have its own lavatory, offices, and cloak-room accommodation, arranged suitably for both girls and boys.

93. Where the Preparatory Department is large, a separate block of buildings is often, and in Boys' Schools a separate playground is always, desirable.

(xii) STAFF ROOMS.

94. (a) The Head Master's or Head Mistress's room should be placed conveniently near the entrance and be provided with a lavatory and closet. (b) Some provision for persons waiting for interviews is desirable. (c) In Schools for both boys and girls, under a Head Master, a separate room is needed for the Senior Assistant Mistress, as well as separate Common-rooms for the staff of each sex.

95. It is advisable to place these rooms in a position facilitating supervision over the playgrounds, access to lavatories, &c.

96. Adequate cloak-rooms, lavatories and closets should be provided in connection with these rooms, apart from those provided for the pupils.

A staff of 3-4 require 2 basins and 1 closet.

„	6-10	„	3	„	2 closets.
„	10-15	„	4	„	3 „

(xiii) STORE ROOMS.

97. There should be sufficient space for storage, which should be separate and convenient for various purposes: for instance, for books and stationery, or for games material and similar properties. Storage space can be most economically provided by designing cupboards as part of the buildings.

(xiv) DINING HALLS.

98. In every school a careful estimate should be made of the number of day pupils who may be expected to dine at the school or bring their own meals, and dining accommodation should be provided accordingly.

99. Not less than 2 feet should be allowed for every pupil at the table, and not less than 10 square feet of floor area.

100. The kitchen and necessary offices, which should include a larder and pantry, should be adjacent to the Dining Hall, with separate entrance, and so placed that the smell of cooking will not be likely to enter the school.

(xv) LIBRARY.

101. In every school it is essential that there should be a room furnished for use as a Library in which pupils can have facilities for consulting and working from books of reference. This room may also be used as a Sixth-Form Room (see § 48).

(xvi) MUSIC ROOMS.

102. In every school in which instrumental Music is taught it is desirable to have a Music class-room unless there is a Lecture or other room that can be conveniently used. Practice-rooms should be about 8 feet by 6 feet 6 inches, divided by sound-proof partitions, and with sound-proof doors. Music and Practice-rooms if provided should be as much isolated as is practicable.

(xvii) GYMNASIUM.

103. A suitable size for a gymnasium is 60 feet by 30; in no case should it be less than 50 feet by 25.

104. It should be constructed with a flat ceiling 16 feet from the floor and lighted by a continuous range of windows down each side; these windows should have the underside of the sills not less than 9 feet from the floor and be hung on centres to swing open. At least one end wall should be left blank.

105. The entrance for the ordinary use of pupils should be through a lobby and changing room so that outdoor boots and shoes are not brought into the gymnasium.

106. The floor should be resilient and to a certain degree resonant; solid floors are therefore unsuitable. Narrow boards running across the room laid on joists will be found the most suitable.

107. Some means of warming must be provided.

108. It is often feasible and desirable to erect a gymnasium of light and cheap construction, separate from but in convenient connexion with the main School building.

(xviii) CLOAK ROOMS.

109. In schools for boys and girls there must be separate cloak-rooms for each sex.

110. (a) Cloak-rooms should be placed conveniently near the pupils' entrances, and if possible near the pupils' offices. (b) They should be entered from properly lighted and ventilated lobbies, and not from any room used for teaching. (c) They must not be used as passages. (d) As cloak-rooms are frequently locked up, it is undesirable to place the lavatory basins in them. (e) They should be heated in order to dry damp cloaks, and well ventilated to ensure that no smell is carried into the school.

111. Cloak-rooms should be amply lighted from the end. The floors should be of asphalt or other impervious material, and the walls of tile or other hard material, or at least with a dado 5 feet high of such materials.

112. It is very desirable to provide a small drying room for wet cloaks.

113. In schools to be used also by evening classes some part of the cloak-room accommodation and offices should be effectively separated from the rest for the use of the evening pupils.

114. Equipment should be provided on the following scale :—

Boys.—Cloak-room pegs, 10 inches apart, in one horizontal row only.

Girls.—Cloak-room pegs, 15 inches apart, in one row only, with seats for changing boots and wire boot-racks.

For both boys and girls a space of 5 feet is required between the stands.

CHANGING ROOMS.

115. In large schools it is desirable to provide changing-rooms, which should be fitted with fixed seats, pegs, lockers, and boot-racks. Provision for foot and spray baths may be made. In small day schools accommodation for changing may be provided in the cloak-room.

(xix) LAVATORIES.

116. Sections 109, 110, and 111 above apply also to lavatories except that the lavatory may serve as access to the closets. Lavatory basins should be provided on the following scale :—

Boys.—One for every 20 pupils up to 100 and one for each succeeding 25, 18 inches being allowed to a basin.

Girls.—One for every 10 pupils up to 100 and one for each succeeding 20, 18 inches being allowed to a basin.

117. A lock-up slop sink, water-tap, and cupboard for use by the caretaker are desirable.

(xx) CLOSETS.

118 (a) The girls' offices should always be in the main building but suitably isolated; if this is not possible, they should be connected by a covered corridor. Privacy of access must always be secured. (b) The boys' offices should be completely disconnected from the school. (c) In Schools for both boys and girls the offices and approaches to them must be wholly separate for the two sexes.

119. (a) Every closet must be not less in the clear than 2 feet 3 inches wide, nor more than 3 feet. (b) Each must be fully lighted and ventilated, and have a door. (c) The door should be at least 3 inches short at the bottom, and at least 6 inches short at the top. (d) The closets are best divided by partitions carried up 6 feet only.

120. The walls should as far as possible be treated with some smooth hard surface upon which writing is impossible.

121. Each closet must be fitted with its own flushing apparatus.

122. The number of closets required is:—

Boys.—One for every 25.

Girls.—One for every 15 up to 100 and one for each succeeding 20.

URINALS.

123. (a) In urinals separate stalls are desirable. (b) One stall should be provided for every 15 boys up to 100 and one for each succeeding 20.

DRAINS.

124. The arrangement of drains should be in accordance with approved modern practice. In the case of schools to be erected by loan, the drainage will have to satisfy the requirements of the Local Government Board.

CHAPTER V.—BOARDING HOUSES.

(i) SITES AND GENERAL.

125. It is necessary that a Boarding School should provide ample space for games and recreation. Where the School is only for Boarders, the freedom of choice as regards position should make it possible to secure this without undue cost. When boarding houses are attached to a day school, the position of which has to be governed by the need of easy access, more difficulty may be experienced, but questions of area, suitable aspect, soil and general hygienic considerations must be carefully considered and suitably met.

126. Suitable and adequate accommodation should be provided for resident members of the staff.

(ii) SLEEPING ROOMS.

127. The pupils may be provided for either in Dormitories or in Cubicles.

128. (a) Dormitories should contain not less than 3 beds; there should be a space of at least 3 feet between beds. (b) In girls' schools, cubicles for all girls over 12 years of age must be curtained or partitioned.

129. (a) A floor area of not less than 65 square feet and a cubic space of 700 cubic feet must be provided for each occupant. (b) Ventilation must be adequate (*see* chapter VI.), and it is very desirable that a through current of air should be provided, by arranging the windows on opposite sides of the room. (c) Cubicles if formed out of a dormitory by partitions not carried up to the ceiling should provide the area required above; each cubicle must have its own window. (d) If the partitions are carried right up, not less than 100 square feet floor area will be required.

130. Closet accommodation for night use must be provided within reasonable access of each dormitory.

131. The rooms for matron and staff should be so placed as to provide for easy supervision of the dormitories.

132. An aspect that allows the sun to enter the rooms freely should be chosen—south or south-east being preferable.

133. All dormitories must have alternative means of escape for use in case of fire. The provision of chemical fire-extinguishers is not advisable.

(iii) BATH-ROOMS, LAVATORIES, AND OFFICES.

134. (a) The washing arrangements may consist of either ordinary hand basins in the dormitories, or, in the case of boys' schools, lavatories placed conveniently near; in the latter case each pupil should be provided with a small rack and towel rail. (b) Fixed lavatory basins should not be fitted in sleeping rooms.

135. (a) There should be baths at the rate of two for every twenty boarders, with separate bath-room provision for the staff. (b) A good plan for daily use is to have a room with a floor of asphalt, lead or other impervious material, with taps and moveable baths, or shower baths. (c) It should be noted that two shower baths divided by waterproof curtains or partitions will occupy the space of one slipper bath, and can also be used more expeditiously.

136. A downstairs changing room and a separate lavatory for day use in connection with it should be provided.

137. The number of closets required for day use is one for every seven boarders.

(iv) DAY ROOMS.

138. Every boarding school or house must have adequate day room accommodation for use during out-of-school hours; these rooms should provide not less than 20 square feet for each boarder. Lockers or other places in which pupils can keep books and private property should be supplied.

There should be a separate sitting-room, or bedroom furnished as a sitting-room, for each member of the resident staff; also a matron's sitting-room and linen-room.

(v) SICK ROOMS.

139. (a) In every boarding school there must be a sick-room, properly isolated. (b) In a sick-room the beds must be free of the walls. (c) There should be a space of not less than 6 feet between beds, and, if possible, a window between every two beds, the windows being opposite each other. (d) All internal angles of walls, floors and ceilings should be rounded.

140. There must be in a sick-room 1,000 cubic feet for each bed.

141. (a) Waterclosets and bathroom, with hospital bath, should be provided, with aerial disconnection from the sick-room. (b) In boarding schools of more than 50 boarders provision for infectious cases should be made in a separate building as far from the main building as can conveniently be arranged.

142. A room for the nurse should be provided, adjoining the sick-room.

(vi) HEAD MASTER'S HOUSE.

143. The Head Master's house, if any, should be planned as a private residence, with accommodation for a family, and, especially in the case of a Boarding School, for the entertainment of visitors. It should be entirely separate from the accommodation for boarders. For the Head Mistress in a Girls' School proper and self-contained apartments with reception rooms should be provided.

CHAPTER VI.—VENTILATION (*see also* §§ 16 and 36 to 45) AND HEATING.

144. Adequate means for ventilating all rooms used for teaching must be provided, not only for admitting fresh air during use, but for flushing the rooms effectually during the intervals.

145. The inlets for fresh air should be large and well distributed, and be provided with some arrangement to divert the incoming air from striking directly on to the pupils and teachers.

146. In order to ensure a sufficient movement of the air, there should be openings on opposite sides of the room, and these should be into the outside air.

147. Where the rooms are properly cross ventilated, ceiling extracts will not be required.

148. (a) One of various economical and effective plans is to have the lower panes of the windows arranged to open inwards as "hopper" inlets with side pieces, the upper parts of the windows being hung on centres to swing, in order to give as large an opening as possible. (b) The windows should be arranged so that at least half their area can be open at once. (c) They may be arranged so that the whole space can be open.

149. Openings behind hot-water radiators, and ventilating grates, are useful adjuncts in cold weather, but do not obviate the need for an ample supply of properly constructed opening windows.

150. Combined systems of heating and ventilation in which air raised to a sufficient degree to warm the rooms is used for ventilation are not generally desirable in a school. The stimulating and invigorating effects of fresh, cool air are lost, and the pupils become accustomed to sit with closed windows.

151. (a) In buildings of more than one storey the ventilation requires particular attention. (b) As far as possible, long trunks and flues for the admission of air, which are difficult to keep clean, should be avoided. (c) Outlets opening into chimney flues or ceiling ventilators do not work well without some mechanical aid.

152. Generally, the best results will be obtained by providing ample heating power, and making full use of well-arranged windows to secure cross-ventilation.

Heating.

153. (a) The heat supplied to the school should be moderate and evenly distributed, so as to maintain a temperature of from 56° to 60° in the rooms. (b) The amount of heating required should be considered carefully in reference to the system of ventilation proposed, for the full use of fresh air openings is largely governed by the power of warming the room quickly. Where cross ventilation is provided a single fireplace will be insufficient to warm the room thoroughly. (c) Where windows are provided on two sides of a room, 25 to 30 square feet of heating surface per 1,000 cubic feet should be secured. (d) In a large room heated by an open fire, the heating should be supplemented by hot-water pipes on the side furthest from the fire.

154. When the heating is by means of hot water it should be at medium or low pressure; high-pressure water and steam heating cannot be approved.

155. Fireplaces and heating apparatus should as far as possible be placed in parts of the room where they will not interfere with the arrangements for teaching.

156. Slow combustion stoves with long flue-pipes cannot be approved.

157. Stoves should be of a pattern with an open fire, and have proper chimneys into which the flue-pipe can be directly taken.

158. Gas radiators or stoves are not approved for warming rooms used for teaching unless they are provided with flues.

Protection from Sun.

159. Windows which face the sun should have blinds.

CHAPTER VII.—CONSTRUCTION AND MATERIALS.

(i) PERMANENT BUILDINGS.

Foundations.

160. (a) The vegetable soil within the area of the building should be removed; (b) the whole space should be covered by a layer of concrete not less than 6 inches thick; and (c), if solid floors are not used (*see* § 167), air bricks should be inserted in opposite walls to ensure a through current of air under floors for ventilation to joists.

161. (a) Except where hard rock, gravel, or chalk bottom is found, concrete foundations must be provided under all new walls.

Walls.

162. If the external walls of a school are of brick, they should be at least one brick and a half thick; if they are of stone, they should be 20 inches thick. Where hollow walls are proposed, one wall should be at least 9 inches thick, with a 2-inch cavity between it and the other wall (*but see* § 164).

163. All walls, not excepting fence walls, should have a damp-proof course just above the ground line.

164. For single-storeyed buildings the Board will be prepared to consider proposals for walls of less thickness; as, for instance, a 9-inch solid brick wall or an 11-inch hollow brick wall, strengthened where necessary with piers. Such walls should be treated with rough cast or cement, or, in the case of hollow walls, a second damp course should be placed in the inner wall one course of bricks above that through the whole wall.

Roofs.

165. Great care should be taken to render the roofs impervious to cold and heat.

166. Roofs open to the apex are not approved. All class-rooms must be ceiled either at the wall-plate or not less than half way up the roof (*see* § 36).

Floors.

167. (a) In a school of more than one storey, special care must be taken to render the floors as far as possible soundproof and fireproof. (b) Solid floors should be used on the ground floor.

(ii) TEMPORARY BUILDINGS.

168. In special circumstances the Board are prepared to sanction the erection of schools of a lighter and less permanent construction; as for example, in colliery districts where, owing to mining operations, there is no site available upon which a building of the ordinary type can be safely erected; or where temporary accommodation is required pending the erection or rebuilding of a school; or in the case of buildings for manual instruction, cookery, and similar purposes only.

169. When such buildings are proposed for recognition for a considerable period, they must be placed upon properly constructed brick foundations, with concrete under the floors, &c., and conform generally to the requirements of an ordinary school building.

170. When a wooden building is proposed, the wood should be chemically treated under pressure.

171. (a) In iron buildings careful precautions are required to guard against extremes of temperature, and unless the building is purely temporary it is well to roof it with some form of thin non-conducting tiles. (b) In any case a ceiling should be provided with an air space between it and the roof. (c) The walls should be lined with felt or some other material capable of absorbing heat and of giving protection against cold.

172. The Board will be prepared to consider and discuss any proposals for the employment of materials or methods of construction other than those usually employed.

CHAPTER VIII.—WATER SUPPLY.

173. In all schools adequate and wholesome drinking water must be readily accessible by the pupils.

174. In cases where it is not taken from the mains of an Authority or Company authorised to supply water, care must be taken to ascertain (a) that the supply will be sufficient, and (b) that the water will be of suitable character and not liable to pollution in any way, as, *e.g.*, by surface drainage, or by leakage from sewers, drains, cesspools, or other receptacles.

175. There should be no direct communication between any pipe or cistern from which water is drawn for domestic purposes and any water-closet or urinal.

176. Any cistern to be used for the storage of water should be watertight and be properly covered and ventilated, and should be placed in such a position that the interior may be readily inspected and cleansed.

177. Where water-pipes are used, they should be so laid or fixed as to be properly protected from frost, and so that in the event of their becoming unsound the water conveyed in them will not be liable to be fouled, or to escape without observation. Provision should also be made for completely emptying any exposed pipes and cisterns.

178. All water-closets and urinals should be provided with proper service cisterns, which, together with the outlets from them, are capable of providing a sufficient flush.

CHAPTER IX.—PLANS AND PROCEDURE.

General.

179. Newly erected premises, unless for good reason, should be planned in accordance with the principles set out in the "Building Regulations," and the Board may refuse to recognise a School, if in their opinion these principles have been departed from unnecessarily.



180. Before they recognise enlargements or alterations of premises which have been already recognised, the Board must be satisfied, by the submission of properly drawn plans and estimates, that the proposals are satisfactory.

181. In cases where the immediate erection of the whole building is not proposed, the portions not to be carried out at once should be clearly indicated.

182. Duplicate copies of the block plan and of the plan of each floor must be sent for retention by the Board.

Byelaws.

183. (a) Attention is directed to section 3 of the Education (Administrative Provisions) Act, 1911, which provides as follows:—

“The provisions of any byelaws made by any local authority under section 157 of the Public Health Act, 1875, as amended by any other Act, with respect to new buildings (including provisions as to the giving of notices and deposit of plans and sections), and any provisions in any local Act dealing with the construction of new buildings, and any byelaws made with respect to new buildings under any local Act, shall not apply in the case of any new buildings being school premises to be erected, or erected according to plans which are under any regulations relating to the payment of grants required to be, and have been, approved by the Board of Education.”

(b) The Board have no power to give an authoritative interpretation of this section; and the question whether the section applies in any particular case is a matter for the consideration of the promoters.

(c) The Board will of course expect that in respect of sanitary matters the plans will come up to the standard set by the Local Government Board's model byelaws, or that departures from that standard will be specially indicated and justified.

Requirements as to Plans.

184. The plans and other information set out below must be furnished in support of proposals for new buildings or for improvements of existing buildings. Plans which do not fully comply with these requirements cannot be considered.

I. A BLOCK PLAN OF THE SITE, drawn in ink to a scale of 20 feet to an inch. This plan must indicate:—

- (a) The position of the school buildings.
- (b) Outbuildings.
- (c) Playground.
- (d) Drains (main and collateral), with their fall and depth below ground.
- (e) Entrances.
- (f) Boundary walls, or fences, and their nature.
- (g) Roads.
- (h) The points of the compass.
- (i) The levels of the ground at the principal points.
- (k) The area of the site in square yards.

N.B.—For approval of the site alone, the plan should show (g) (h) (i) and (k).

II. (a) A PLAN OF EACH FLOOR OF ALL THE BUILDINGS drawn in ink to a scale of 8 feet to an inch. The internal fittings of the rooms (fireplaces, groups of desks, etc.) must be accurately shown. The plan should also state whether the rooms are intended for boys or girls.

(b) In cases of enlargements, a plan showing the buildings as they exist is needed.

III. SECTIONS and at least four ELEVATIONS, also drawn in ink to a scale of 8 feet to an inch. The ceiling, the positions of window-heads in relation thereto, and the mode of ventilation must be shown.

N.B.—(a) Pencil drawings cannot be received, but coloured tracings in ink on tracing linen may be submitted while plans are in the preliminary stage, so that suggested alterations can be adopted without difficulty or expense. Such plans may be drawn to a scale of

16 feet to one inch. The Board's final approval will not in any case be given to preliminary plans, and the full plans described above will always be required.

- (b) Diagrams are of no value and cannot be accepted.
- (c) In the case of enlargements or alterations the whole site and the existing building should be as accurately shown in every respect as the proposed changes, and in such a manner that any change of numbers can be ascertained.
- (d) All plans should be dated, the scales drawn on, and dimensions figured.
- (e) All plans should be submitted on tracing linen or other material which can be folded.

IV. A concise description of the buildings, and of the various rooms, with their dimensions and uses. The total number of scholars of each sex for whom it is proposed to provide accommodation must be stated.

V. A SPECIFICATION.

VI. AN ESTIMATE of the total expenditure proposed, on the form prescribed by the Board of Education.

Procedure for the submission of Plans to the Board.

185. (a) In the case of a new building or extensive alterations, preliminary or sketch plans drawn either to $\frac{1}{16}$ or $\frac{1}{8}$ inch to a foot and accompanied by a rough estimate based upon the cubic contents of the building should be submitted to the Board.

(b) When the scheme and approximate estimate have been provisionally approved, the full plans should be prepared, and should be submitted to the Board with the other particulars set out in Section 184. When the Local Education Authority or Governing Body are in a position to say exactly what the total cost of the scheme will be, either from tenders received or upon a close estimate, the forms supplied by the Board should be filled up and sent with the full plans for final approval. One of these forms is sent on to the Local Government Board in all cases in which a loan will be required, so that it must be regarded as a complete statement of the amount of the loan for which application will be made.

(c) Plans must, except in special circumstances, be submitted to the Board through the Governing Body by their recognised correspondent, unless that body has approved the direct submission of plans to the Board by an Architect or by a Committee. In such cases the covering letter should refer to the direction or approval of the Governing Body, and failing this the Board may decline to consider the plans.

(d) Plans sent to the Board, and correspondence on them, should invariably be addressed to the Secretary, Board of Education, Whitehall, London, S.W., and not to any officer of the Board by name.

APPENDIX.

LOANS IN RESPECT OF SCHOOLS OTHER THAN PUBLIC ELEMENTARY SCHOOLS.

In the case of all applications for sanction to loans, the Local Government Board should be furnished with—

1. A copy of the resolution of the Council directing the application for sanction to the loan required and giving the name of the proposed school.
 2. A copy (on tracing cloth or paper mounted on linen) of the block plan approved by the Board of Education.
 3. A full explanation of the difference, if any, between the amount of the loan desired and the amount of the estimate approved by the Board of Education.
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10 feet to one inch. The Board's final approval will not in any case be given to preliminary plans, and the full plans described above will always be required.

- (b) Plans are of no value and cannot be accepted.
- (c) In the case of enlargements or alterations the whole site and the existing building should be as accurately shown in every respect as the proposed changes, and in such a manner that any change of numbers can be ascertained.
- (d) All plans should be dated, the scales drawn on, and dimensions given.
- (e) All plans should be submitted on tracing linen or other material which can be folded.

IV. A concise description of the buildings, and of the various rooms, with their dimensions and uses. The total number of scholars of each sex for whom it is proposed to provide accommodation must be stated.

V. A SPECIFICATION.

VI. AN ESTIMATE of the total expenditure proposed, on the form prescribed by the Board of Education.

Provision for the submission of Plans to the Board.

185. (a) In the case of a new building or extensive alterations, preliminary or sketch plans drawn either to 1/4" or 1/8" inch to a foot and accompanied by a rough estimate based upon the cubic contents of the building should be submitted to the Board.

(b) When the scheme and approximate estimates have been provisionally approved, the full plans should be prepared, and should be submitted to the Board with the other particulars set out in Section 184. When the Local Education Authority or Governing Body are in a position to say exactly what the total cost of the scheme will be, other than from tenders received or upon a close estimate, the forms supplied by the Board should be filled up and sent with the full plans for final approval. If a close estimate is not sent or if the Local Education Board in any cases in which a loan will be required, so that it must be regarded as a complete statement of the amount of the loan for which application will be made.

(c) Plans must, except in special circumstances, be submitted to the Board through the Governing Body, by their recognised correspondent, unless that body has approved the direct submission of plans to the Board by an Architect or by a Committee. In such cases the covering letter should refer to the direction or approval of the Governing Body, and stating that the Board may desire to consider the plans.

(d) Plans sent to the Board, and correspondence on them, should invariably be addressed to the Secretary, Board of Education, Whitehall, London, S.W., and not to any officer of the Board by name.

APPENDIX

LOANS IN RESPECT OF SCHOOLS OTHER THAN PUBLIC ELEMENTARY SCHOOLS.

In the case of all applications for a loan the Local Education Board should be furnished with—

1. A copy of the resolution of the Council directing the application for a loan to be made, and giving the name of the proposed school.
2. A copy (on tracing cloth or paper mounted on linen) of the full plan approved by the Board or the Local Education Authority.
3. A full explanation of the necessity, if any, for the loan, and the amount of the loan, and the estimate approved by the Board of Education.